



TITLE:

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## How does the use of a foreign language affect team processes and member stress and satisfaction?

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This study looked at how team-level processes (communication) affected team-level outcomes (participation in decision making and team creativity) and individual-level outcomes (stress and satisfaction) for Chinese people who used either their native language or a foreign language, Japanese, in task-related team settings. An experimental study was conducted with a sample of 54 teams of Chinese students ( $N = 222$ ) majoring in the Japanese language. All participants were randomly assigned to either the control group (native language condition) or the experimental group (foreign language condition). The results indicated that the use of a foreign language in team situations tended to lead to lower communication and participation in decision making at the team level, and higher stress and lower satisfaction at the individual level. Moreover, we found that communication mediated the relationships between language and the two team-level outcomes; and member stress mediated the relationship between language and member satisfaction. Cross-level moderating effects of team-level participation in decision making on the individual-level relationship between foreign language and individual outcomes were also found. Specifically, the positive (negative) effect of using a foreign language on stress (satisfaction) became more pronounced as the level of participation in decision making increased.

Keywords : foreign language, team effectiveness, member communication, participation in decision making, team creativity, stress, satisfaction, cross-level analysis

### 1 INTRODUCTION

In today's globalizing world, a growing number of people need to use a foreign language(s) in their daily work. This trend can be seen even in a relatively homogeneous country - Japan, where the economic expansion in recent years has been accompanied by movement of business

expatriates from abroad who need to be able to speak Japanese at work to get along with Japanese coworkers, to make important decisions with them, or to open up additional employment opportunities. Also emerging are some Japanese companies that started to use English as their official corporate language (Yamao & Sekiguchi, 2015). This means that an increasing number of Japanese workers are required to communicate in English even when speaking to their Japanese coworkers. A question then arises

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es: *How are team processes and team- and individual-level outcomes affected when members speak a foreign language instead of their native language?*

To answer the above question, this study investigates whether the use of a foreign language influences team processes and such team-level outcomes as communication, participation in decision making, and creativity as well as such individual-level outcomes as perceived stress and satisfaction. Although a team-based structure has evolved in modern organizations (DeChurch & Mathieu, 2009) and attracted much research attention, studies on the effects of language on team processes and outcomes are long overdue (Henderson, 2005; Tenzer & Pudelko, 2012; Tenzer, Pudelko, & Harzing, 2014; Zakaria, Amelinckx, & Wilemon, 2004).

In this paper, we first delineate past theories and research on the use of a foreign language in the international business context as well as on key processes and outcomes in team settings. Next, we develop a set of hypotheses regarding how the use of a foreign language influences team-level and individual-level processes and outcomes. We will then design and conduct an experiment to test those hypotheses. We believe that results to be found in this study would add significant theoretical insights to the existing literature on international business, thereby leading to important practical implications for the context.

## 2 THEORETICAL BACKGROUND

### 2.1 Language Studies in International Business

Language became an important subject in international business studies toward the end of the 20th century and beyond. Language can not only distort communication but also acts as a facilitator of inter-unit communication, and it

can also be a source of power in multinational corporations (MNCs) (Marschan-Piekkari, Welch, & Welch, 1999b). Therefore, language has been discussed as a single entity, separately from cultural issues in MNCs. To investigate the role of language in international business, some researchers conducted the in-depth qualitative assessment of one or two MNCs (e.g., Barner-Rasmussen & Björkman, 2007; Marschan-Piekkari et al., 1999a, 1999b), while others conducted large-scale surveys that involved many MNCs (e.g., Harzing & Pudelko, 2013).

In earlier studies, researchers focused mainly on the influence of language on the way the headquarters (HQ) manage their subsidiary operation or the HQ-subsidiary relationship (Harzing, Köster, & Magner, 2011). For example, it was found that the HQ-subsidiaries relationship is influenced by language, such that the language barrier could damage the HQ-subsidiary interactions (Harzing & Pudelko, 2014). In recent years, a growing number of scholars have narrowed the study focus from the level of an MNC as a whole to the level of multinational teams within the MNC (e.g., Tenzer & Pudelko, 2013). For example, researchers have pointed out that although language can help team building (Henderson, 2005), it can also act as a barrier to disrupt upward, downward and horizontal flows of communication (Schweiger, Atamer, & Calori, 2003). Other researchers suggest that language diversity in teams is more challenging than cultural diversity in interactions among members of multinational teams (Zakaria et al., 2004). Still other researchers mention that language is connected with thought processes and social interactions, both of which may influence the communication process within multinational teams (Chen, Geluykens, & Choi, 2006).

Language also plays an essential role at the

individual level (Barner-Rasmussen, Ehrnrooth, Koveshnikov, & Mäkelä, 2014). For example, individuals may adjust their thoughts and behaviors depending on the language that they use (Zander, Mockaitis, & Harzing et al., 2011). Therefore, cognitive distortion can occur because of uncertainty, anxiety, and mistrust stemming from the communication process, which would result in communication failures (Harzing & Feely, 2008).

## 2.2 Team Processes and Outcomes

This study examines team member communication, participation in decision making, and creativity as team processes and outcomes. First, communication is a key to building a successful team because it incorporates producing, sending, and receiving information regarding team tasks and member relationships (Jackson, May, & Whitney, 1995; van den Born & Peltokorpi, 2010; Zakaria et al., 2004). Effective communication promotes information sharing, feedback, and social support from team members and thereby helps members self-manage their own work (e.g., Tindale & Sheffey, 2002). On the other hand, communication difficulties impede the performance of multinational teams (Chen, Geluykens, & Choi, 2006).

Second, team members' active participation in decision making is also vital to team effectiveness, especially when teams engage in creative or problem-solving tasks (De Dreu & West, 2001). To make significant decisions in teams, the teams seek valuable information regarding the team tasks (Choo, 1996). Consensus or disagreement occurs when task-related information is organized, transmitted, and interpreted (Cowan, 1986; Simon, 1987). In this case, team members' active participation in decision making improves the quality of decisions by sharing

information effectively (Cabrera & Cabrera, 2005).

Third, team creativity, which is defined as the generation of novel and useful ideas by team members working together (see, e.g., Amabile, 1988; Woodman, Sawyer, & Griffin, 1993), is considered to be one of the indicators of team effectiveness. Creativity in teams and organizations is critical because it can be the source of innovation, which is a key factor to successful adaptation to changing environments (Choo, 1996). Past research demonstrated that team creativity increases when information exchange among team members increases as well as when a supportive climate for creativity exists (Antoszkievicz, 1992; Gong, Kim, Lee, & Zhu, 2013; King & Anderson, 1990).

## 2.3 Member Stress and Satisfaction

Member stress and satisfaction are the individual-level outcomes to be examined in this study. In general, stress in an organization is extremely important. It is generally known to be associated with various physiological, psychological, and behavioral symptoms. For example, Schuler (1980) shows that stress causes such organizational problems as low productivity, dissatisfaction, and high turnover (Schuler, 1980). Ellis (2006) considers stress to be a factor that decreases team performance and effectiveness.

Satisfaction has also attracted much attention in the area of organizational psychology because of its association with motivation, commitment and performance of team members (e.g., Blendell, Henderson, Molloy, & Pascual, 2001; Klimoski & Jones, 1995; Salas, Dickinson, Converse, & Tannenbaum, 1992). According to the extant literature, satisfaction within teams is determined by a combination of factors, such as the composition of the team, the work process

within the team, and the nature of the work itself (Campion, Medsker, & Higgs, 1993).

2.4 Cognitive Load Theory and Job Demands-Resources Theory

In the current study, we rely on the cognitive load theory and the job demands-resources (JD-R) theory as guiding frameworks to develop our hypotheses. The *cognitive load theory* focuses on how to reduce cognitive load so that limited cognitive capacity and resources can be applied to acquiring new knowledge and skills (Paas, Tuovinen, Tabbers, & van Gerven, 2003). This theory suggests that the cognitive capacity of working memory is limited, which means that activities will be hindered if a task exceeds the available capacity (De Jong, 2010). Therefore, failing to perform a complex cognitive task can be attributed to the required level of cognitive demands that exceed the cognitive capacity available for the incumbent (Paas et al., 2003).

The *JD-R theory* (Bakker & Demerouti, 2007; Bakker, Demerouti, De Boer, & Schaufeli, 2003; Bakker, Demerouti, & Verbeke, 2004) specifies

that stressors in the workplace are produced by the relationship between two categories: job demands and job resources. Job demands represent characteristics of the job that require effort or skills associated with physiological and/or psychological (i.e., cognitive and emotional) costs. Job resources refer to all aspects of the job that can facilitate the completion of tasks and reduce job demands. Personal development and learning are also job resources (Bakker & Demerouti, 2007).

To interpret job demands and job resources in the team context, job demands are the characteristics of the team tasks that require effort and skills from individual members. Job resources, on the other hand, represent all aspects of the team characteristics that can facilitate the completion of a team task and reduce its demands.

3 HYPOTHESES

Figure 1 illustrates our integrative model, which consists of: (a) the effect of language on team-level processes and outcomes (i.e., com-

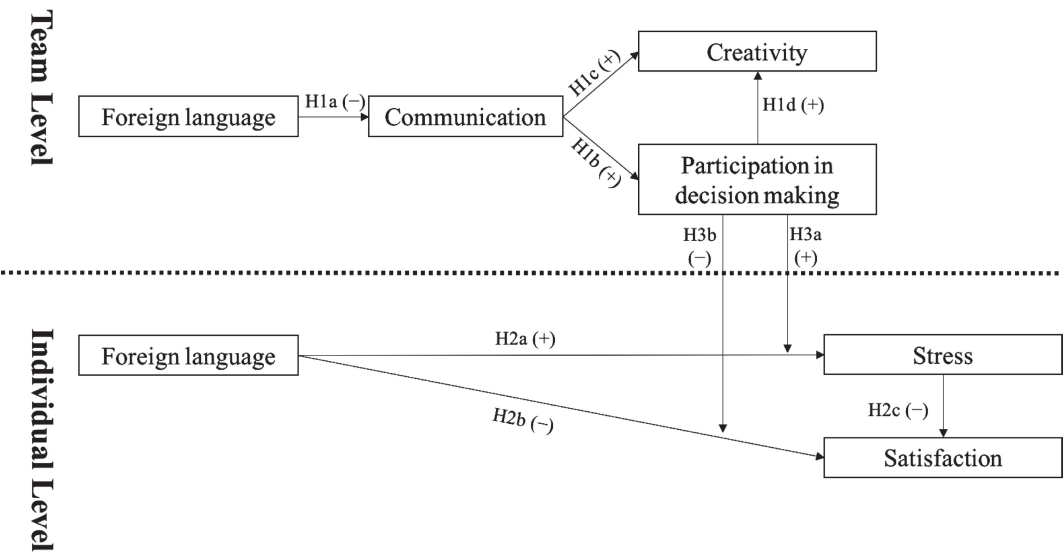


Figure 1 Conceptual Model

munication, participation in decision making, and creativity), (b) the effect of language on individual-level outcomes (i.e., stress and satisfaction), and (c) the cross-level moderation of the team-level variable (i.e., participation in decision making) on the individual-level predictor-criterion relationships (i.e., the effect of language on stress and satisfaction). The plus and minus signs on the causal arrows denote positive and negative relationships predicted between the variables.

### 3.1 The Effect of Language on Team Processes and Outcomes

We predict that the use of a foreign language in teams has a negative effect on communication among team members, which in turn influences their participation in decision making and creativity. First, cognitive load theory suggests that when teams use a foreign language, the intrapersonal cognitive process will limit team members' abilities to perform (Volk, Köhler, & Pudenko, 2014). For example, foreign language processing increases working memory load and ties up scarce cognitive resources (Volk et al., 2014), leaving fewer processing capacities for other cognitive tasks. Therefore, team members have less capacity to absorb information about team tasks when they are working in a foreign language. In this case, transmission and interpretation of information will be impeded, and communication within the teams cannot be well established. Therefore, the use of a foreign language will be negatively related to communication among team members.

Second, we predict that the degree of communication among team members is positively related to members' participation in decision making and creativity. Communication can increase the quality and quantity of member

interactions (Hinds & Mortensen, 2005) and participation in decision making that includes sharing and exchanges of information (Korsgaard, Schweiger, & Sapienza, 1995; Srivastava, Bartol, & Locke, 2006), a condition necessary for the members to create new knowledge and insights (Leenders, van Engelen, & Kratzer, 2003). Indeed, research shows that sharing of information and knowledge regarding tasks is positively linked to team performance, especially to team creativity, innovation, and decision quality (van Knippenberg, De Dreu, & Homan, 2004). Thus, participation in decision making and team creativity can be enhanced when the degree of communication among team members is high. Based on this reasoning, we assume that the effect of foreign language on creativity can be direct and/or indirect via participation in decision making.

Additionally, we predict that participation in decision making influences creativity positively, assuming that team creativity is a product of a series of intensive and collaborative decision making events among team members (Amabile, 1988; Amabile, Schatzel, Moneta, & Kramer, 2004; Zhang & Bartol, 2010). It is reasonable to assume, therefore, that communication among team members can influence team creativity directly and/or indirectly through participation in decision making. Based on the discussion thus far, we predict:

**Hypothesis 1a.** *The use of a foreign language is negatively related to communication.*

**Hypothesis 1b.** *Communication is positively related to participation in decision making.*

**Hypothesis 1c.** *Communication is positively related to creativity.*

**Hypothesis 1d.** *Participation in decision making is positively related to creativity.*

To summarize, we assume a series of mediational indirect chains in these hypotheses (foreign language → communication → creativity; foreign language → communication → participation in decision making; communication → participation in decision making → creativity; and foreign language → communication → participation in decision making → creativity).

### 3.2 The Effects of Language on Member Stress and Satisfaction

Drawing on cognitive load theory and the JD-R theory, we assume that the use of a foreign language increases member stress and decreases member satisfaction during team tasks. When working in a foreign language as opposed to a native language, the job demands come not only from the team tasks but also from using a foreign language. Therefore, job demands will be higher in a foreign language environment than in a native language environment. In addition, when using a foreign language, cognitive load increases because of the lower language proficiency, which further depletes cognitive resources (Volk et al., 2014). Thus, cognitive resources may not be sufficient to meet the job demands in the foreign language environment. Additionally, cognitive distortion occurs in the case of feelings of uncertainty, anxiety, and mistrust arising from communication in a non-fluent language (Howard, 1995; Takano & Noda, 1993; Volk, Köhler, & Pudelko, 2014).

Because job demands exceed employees' cognitive capacities or comfort zones, the cognitive load and distortion stemming from the use of a foreign language can become the sources of stress experienced by team members (Meijman & Mulder, 1998). Additionally, because of the excessive job demands and cognitive load, team members would feel less confident in per-

forming their tasks well. This situation should decrease the members' satisfaction with team tasks, as suggested by ample evidence that stress causes dissatisfaction (Bakker & Demerouti, 2007; Hoboubi, Choobineh, & Ghanavati et al., 2017; Schaufeli & Bakker, 2004). Therefore, we have:

**Hypothesis 2a.** *The use of a foreign language is positively related to stress.*

**Hypothesis 2b.** *The use of a foreign language is negatively related to satisfaction.*

**Hypothesis 2c.** *Stress is negatively related to satisfaction.*

To summarize, these hypotheses are to test whether foreign language affects satisfaction directly and/or indirectly through stress.

### 3.3 Cross-level Relationship

Finally, we examine the cross-level interaction in which a team-level variable (i.e., participation in decision making) influences the individual-level relationships foreign language has with member stress and satisfaction. We choose participation in decision making from team-level variables because it seems to be the most proximal variable that may influence the individual-level effects of foreign language on member stress and satisfaction.

As predicted in Hypotheses 2a and 2b, the use of a foreign language increases stress and decreases satisfaction, a prediction based on the cognitive load theory and the JD-R theory. Also consistent with those theories is the assumption that when the level of participation in decision making is high at the team level, which is a necessary condition to make collective decisions, team members need to be more active in such cognitive activities as analytical thinking and evaluations of alternatives. These activities, if



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carried out by the use of a foreign language, would further amplify the levels of job demands and cognitive load, which in turn would have a detrimental effect on member stress and satisfaction. Thus, we predict:

**Hypothesis 3a.** *Participation in decision making within teams moderates the positive relationship between the use of a foreign language and stress, such that the relationship becomes stronger as the level of participation in decision making increases.*

**Hypothesis 3b.** *Participation in decision making within teams moderates the negative relationship between the use of a foreign language and satisfaction, such that the relationship becomes stronger as the level of participation in decision making increases.*

## 4 METHOD

### 4.1 Participants

Data were collected from 222 college students (average age, 21 years; 79% females). They were all Chinese majoring in the Japanese language at universities in China ( $n = 146$ ) or in Japan ( $n = 76$ ). Although some of the participants spoke with a Chinese dialect, the majority had a native-speaker-level command of the Mandarin language. As for the Japanese language, on the other hand, none of the subjects reached the native or bilingual level.

A major reason for collecting data from Chinese students living in Japan comes from our belief that doing so would best reflect the reality in Japan. According to Japanese Ministry of Health, Labour and Welfare (2017), the number of Chinese business expatriates in 2017 is approximately 372 thousand (8% increase from the previous year), which has been the largest expatriate population in Japan in recent years.

### 4.2 Procedure

First, all participants were asked to fill out a questionnaire designed to take about 10 minutes in laboratory settings. It consisted of items regarding the participants' demographic information and items for assessing the levels of their perceived proficiency in the Japanese language on a scale from 1 (novice) to 5 (intermediate) to 10 (fluent) (see Appendix A). The participants were then randomly assigned to either an experimental group or to a control group, and those in each of the groups were randomly divided into 27 groups, each consisting of four or five members. The mean score of language proficiency for the control group was 5.96 ( $SD = 1.15$ ); for the experimental group, it was 5.93 ( $SD = 1.29$ ). The statistical comparison of the means did not reach statistical significance ( $t = .17$ ).

The participants assigned to the experimental group were required to perform a 30-minute team task using a foreign language, Japanese, while those assigned to the control group were allowed to use their native language during the task. On completion of the task, we distributed a post-test questionnaire (to be completed within 10 minutes) to assess the levels of communication, participation in decision making, and creativity at the team level and the levels of stress and satisfaction at the individual level.

### 4.3 Team Task

Participants were requested to engage in a marketing exercise frequently used in Japanese business schools. While it is not a perfect representation of real working experience in MNCs outside Japan, the task is based on a real marketing problem experienced by a Japanese *tatami* company. The case had been pretested in an interdisciplinary program at Osaka Univer-



sity to ensure that all students could solve the task regardless of their discipline or whether they had specific knowledge about marketing. Assuming the case to be usable in the context of this study, we translated the contents and instructions of the team task into Chinese.

Because the *tatami* company exists in Japan, we used a pseudonym to preserve its anonymity. We provided all teams with information about the history of the company and some advantages of their new line of *tatami* over the traditional one, such as its modern design and allergy-preventative qualities. We introduced the case briefly with an explanation that the goal of our research was to investigate how to help the language major students experience pseudo-business practices in MNCs. Participants were then requested to use the designated language (Japanese or Chinese), discuss the marketing issues the company faces, and then reach a conclusion that was phrased in such a way as to propose a marketing plan to increase sales. At the end of the team task, all teams handed in their proposals in Japanese or Chinese. Nine raters evaluated the proposals in terms of magnitude, radicalness, and usefulness to assess overall creativity.

#### 4.4 Measures

All measures except for foreign language, creativity, and control variables were measured using 7-point Likert scales. The answer alternatives for stress ranged from 1 (never) to 7 (very often), and those for the remaining variables ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). The wordings of all the selected items were then slightly modified to fit the study context. All scales are listed in Appendix.

**Foreign language.** A dummy variable (foreign language) was constructed to represent different

levels of experimental manipulation. It was coded as 1 if a participant belonged to the experimental group; otherwise, it was coded as 0.

**Communication.** Communication within teams was measured using the three-item scale devised by Campion and colleagues (1993). The items are listed in Appendix B.

**Participation in decision making.** Participants indicated the levels of their participation in decision making on Campion et al.'s (1993) Work Group Characteristics Measure. Out of the original three items, we selected two items that seemed relevant to our study (see Appendix C).

**Creativity.** Team-level creativity was rated by nine domain-relevant experts: One is a lecturer in the management department of a university, two work at Japanese companies, one works for a U.S. consulting company, and the remaining five raters are all Chinese students in the business doctoral programs of Osaka University. All of the nine raters have a good command of both Chinese and Japanese.

To be considered creative, ideas must be unique compared with other ideas currently available (Shalley, Zhou, & Oldham, 2004). Ideas should also have potential to create value for the organization in the short or long term (George, 2007). The raters were requested to read all ideas submitted by the teams and rate them in terms of the levels of creativity.

Somech and Drach-Zahavy's (2013) three dimensions scale (i.e., magnitude, radicalness, and usefulness) was used to rate the ideas (see Appendix D). Magnitude is defined as how great the consequence of this proposal would be; radicalness corresponds to the extent to which the proposal would likely to change the status quo; and usefulness refers to the extent to which the proposal is beneficial for the com-

pany.

The values of intraclass correlation coefficient (ICC) values representing inter-rater reliabilities were .48 ( $F [49, 392] = 2.42, p < .01$ ) for magnitude; .44 ( $F [49, 392] = 2.46, p < .01$ ) for radicalness; and .50 ( $F [49, 392] = 2.60, p < .01$ ) for usefulness. The intraclass correlation coefficients were all within the .40 to .75 range, indicating fair to good reliability and therefore justifiable for aggregation (Fleiss, Levin, & Paik, 2003). The overall scores on the magnitude, radicalness, and usefulness dimensions of creativity were respectively calculated by averaging the nine rating scores for each of the dimensions. Creativity scores were then calculated by averaging the scores of these three dimensions.

**Stress.** Participants indicated their individual-level stress on the eight-item global measure of perceived stress developed by Cohen, Kamarck, and Mermelstein (1983). Out of the original 14 items, we selected eight items that seemed relevant to our study. The wordings of the selected items were then slightly modified to fit the study context (see Appendix E).

**Satisfaction.** Satisfaction at the individual level was measured using a twelve-item scale based on the Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, & England et al., 1967) and two items devised by Schweiger, Sandberg, and Ragan (1986). Out of the original 20 items of MSQ and 12 items developed by Schweiger et al. (1986), we selected the 14 items that seemed relevant to our study (see Appendix F).

**Control variables.** To minimize the influence of other exogenous variables, we included several control variables for both individual and team levels. We controlled for age and gender (male = 0, female = 1) at the individual level since past research suggests that age and gender may affect exhaustion and expectations,

which may influence stress and satisfaction. For example, research shows that younger females tend to experience higher levels of occupational stress, and that females in general tend to experience higher levels of job satisfaction than do males (Antoniou, Polychroni, & Vlachakis, 2006; Clark, 1997).

We also controlled for average age, average gender (proportion of females), and team size at the team level because past research suggests that females are higher in willingness to communicate, that age captures individual experiences and perspectives, and that team size can influence strategic decision processes. All of these factors may affect the team processes and outcomes (Baugh & Graen, 1997; Cannella, Park & Lee, 2008; De Dreu & West, 2001; Donovan & MacIntyre, 2004; Simons, Pelled, & Smith, 1999).

## 4.5 Analyses

Our data are structured in multi-levels, in which participants (individual-level) were nested in teams (team-level). In addition, our hypotheses include individual-, team-, and cross-level relationships. Therefore, we conducted our analyses based on a combination of multiple regression analyses and hierarchical linear modeling (e.g., Chen, Kirkman, & Kanfer et al., 2007). We used ordinary least-squares regression when testing the team-level relationships. We used hierarchical linear modeling with the R package, lme4 (Bates, Maechler, Bolker, & Walker, 2014) when testing the individual-level and cross-level relationships (e.g., Gavin & Hofmann, 2002). To test mediations, we followed Baron and Kenny's (1986) approach. In addition, we tested the indirect effects assumed for the team-level variables by using the bootstrapping approach across 2,000 bootstrapping

samples (Hayes, 2013); for the indirect effects assumed for the individual-level variables, we employed the quasi-Bayesian approximation approach with 2,000 simulations (Tingley, Yamamoto, & Hirose et al., 2014).

## 5 RESULTS

### 5.1 Aggregation Tests

To support the aggregation of individual scores to team-level variables, we calculated two intraclass correlations (ICC1 and ICC2) and interrater agreement ( $R_{wg[j]}$ ) among team members (Bliese, 2000; James, Demaree, & Wolf, 1984). ICC1 indicates the proportion of variance in ratings due to team membership, and ICC2 represents the reliability of team mean differences.  $R_{wg[j]}$  refers to the interrater agreement based on  $j$  parallel-items. The coefficients for communication were ICC1 = .23 and ICC2 = .55 ( $F [53, 166] = 2.22, p < .01$ ); for participation in decision making, they were ICC1 = .16 and ICC2 = .44 ( $F [53, 167] = 1.80, p < .01$ ). The mean  $R_{wg[j]}$  values were .84 and .78 for communication and participation in decision making, respectively. These results provide support for aggregating the individual-level communication and participation in decision making to the team-level variables. As for other team-level variables, language was dummy-coded, and team creativity was originally assessed at the team level.

### 5.2 Measurement Properties

Prior to examining our hypotheses, we conducted confirmatory factor analyses to assess the properties of the factors at the individual and team levels (communication, participation in decision making, and creativity at the team level and stress and satisfaction at the individual level) using the lavaan package in R (Rosseel,

2012). Because the original measures for satisfaction and stress consisted of many indicators, we reduced the number of indicators. Following the item-parceling approach used in Mathieu and Farr (1991), the indicators were established by first fitting a single factor solution to each set of items and then averaging the items with highest and lowest loadings until all items were assigned. We reduced the number of items for stress and satisfaction from eight to four and from fourteen to four, respectively. For other measures, we did not parcel any items.

The proposed three-factor baseline team-level model showed a reasonable fit to the data, although RMSEA was beyond the recommended standard of less than .08 (Kline, 2005) ( $\chi^2 [17] = 30.48, p < .05$ ; TLI = .94; CFI = .97; SRMR = .06; RMSEA = .12). The proposed two-factor baseline individual-level model also showed a reasonable fit ( $\chi^2 [19] = 66.70, p < .01$ ; TLI = .94; CFI = .96; SRMR = .05; RMSEA = .11). These results provide support for the validity of the measures used in this study. Descriptive statistics and correlations of the individual- and team-level variables are provided in Table 1.

### 5.3 Testing Hypotheses

**Test of hypothesis 1.** Table 2 shows the results of the multiple regression analyses and estimation of indirect effects for the team-level variables (Hypotheses 1a through 1d).

Model 1 in Table 2 shows that foreign language was negatively related to communication at the team level ( $\beta = -.51, p < .01$ ), which supports Hypothesis 1a. In addition, Models 3 and 6 show that communication was positively related to participation in decision making ( $\beta = .75, p < .01$ ) and team creativity ( $\beta = .26, p < .01$ ), which supports Hypotheses 1b and 1c, respectively. However, as shown in Model 7,

Table 1 Descriptive Statistics and Correlations of Study Variables<sup>a, b, c</sup>

Variable	M (SD)	$\alpha$ (of items)	1	2	3	4	5	6	7
Team level									
1. Language	.50 (.50)	.79 (4)	—						
2. Communication	5.62 (.60)	.90 (3)	-.44**	—					
3. Participation in decision-making	5.65 (.64)	.86 (2)	-.60**	.65**	—				
4. Creativity	3.55 (.50)	.92 (3)	-.34*	.37**	.34*	—			
5. Average age	20.91 (.95)		-.00	.08	-.07	-.03	—		
6. Average gender	.78 (.26)		.01	.22	.05	.02	-.11	—	
7. Team size	4.11 (.32)		.24	-.16	-.11	.09	.12	.02	—
Individual level									
1. Language	.51 (.50)	.79 (4)	—						
2. Stress	3.50 (.88)	.77 (8)	.19**	—					
3. Stress (parceled)	3.50 (.88)	.78 (4)	.19**	1.00**		—			
4. Satisfaction	5.15 (.78)	.94 (14)	-.22**	-.43**	-.43**	—			
5. Satisfaction (parceled)	5.15 (.78)	.95 (4)	-.22**	-.44**	-.44**	1.00**	—		
6. Age	20.92 (1.24)		-.01	-.04	-.04	.01	.01	—	
7. Gender	.79 (.41)		.02	.03	.03	.15*	.15*	-.10	

Notes. <sup>a</sup> Individual N = 222; Team N = 54;

<sup>b</sup> Foreign language: 0 = Chinese; 1 = Japanese; Gender: 0 = male; 1 = female.

<sup>c</sup> \* $p < .05$ ; \*\* $p < .01$ .

participation in decision making was not significantly related to creativity ( $\beta = .16$ , *ns*). Thus, Hypothesis 1d was not supported. Including all the predictors in Model 8, we found that neither the predictors nor the *F* statistic reached statistical significance. We checked for multicollinearity by computing VIF, which ranged from 1.09 to 2.33 in Model 8, and from 1.05 to 1.36 in Model 4. This means that multicollinearity was not an issue in the analyses (O'Brien, 2007). The nonsignificant results in Model 8 might be due to the low statistical power affected by the relatively large number of estimated parameters for the small sample size. More specifically, the

post-hoc power analysis indicated that the team-level sample size of more than 56 was desirable to minimize Type II error, assuming the effect size of .28 (i.e.,  $(.22^2 / (1 - .22^2))$  in Model 8), the power level of .8, the significance level of .05 for the model with 6 predictors. Moreover, it should be noted that the effect size itself was very small, suggesting that we could have included in the model more theory-driven predictors that would enhance the prediction of creativity.

Next, we tested the mediating relationships indicated by Hypotheses 1a through 1c, focusing on the mediating effect of communication. The mediating effect of participation in deci-

Table 2 Results for the causal relationships among group-level variables<sup>a, b, c, d</sup>

Variable	Team Level							
	Communication	Participation in Decision making				Creativity		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Average age	.07 (.08)	-.05 (.08)	-.10 (.07)	-.09 (.07)	-.03 (.07)	-.05 (.07)	-.02 (.07)	-.05 (.07)
Average gender	.55 (.28)	.13 (.28)	-.28 (.27)	-.18 (.24)	.03 (.25)	-.11 (.26)	.01 (.25)	-.11 (.26)
Team size	-.16 (.24)	.08 (.24)	.04 (.22)	.17 (.20)	.29 (.21)	.33 (.21)	.28 (.21)	.33 (.21)
Foreign language	-.51** (.15)	-.78** (.15)		-.50** (.14)	-.37** (.13)	-.24 (.14)	-.25 (.17)	-.23 (.16)
Communication			.75** (.12)	.56** (.12)		.26* (.12)		.25 (.15)
Participation in decision making							.16 (.13)	.02 (.15)
R <sup>2</sup>	.27	.37	.45	.57	.15	.22	.17	.22
Adjusted R <sup>2</sup>	.21	.32	.41	.53	.08	.14	.09	.11
F	4.43**	7.33**	10.18**	12.81**	2.09	2.66*	2.00	2.17
Indirect Effect					Estimate	95% CI Lower	95% CI Upper	
Foreign language → communication → participation in decision making					-.28**	-.51	-.11	
Foreign language → communication → creativity					-.13*	-.30	-.01	

Notes. <sup>a</sup> Team N = 54; Foreign language: 0 = Chinese; 1 = Japanese; Gender: 0 = male; 1 = female.

<sup>b</sup> \* $p < .05$ ; \*\* $p < .01$ .

<sup>c</sup> CI = confidence interval

<sup>d</sup> Standard errors are in parentheses.

sion making was not tested, as Hypothesis 1d was not supported. According to Baron and Kenny (1986), the following four conditions are essential to establishing mediation: (1) the independent and mediating variables must be significantly related; (2) the independent and dependent variables must be significantly related; (3) the mediating and dependent variables must be significantly related; and (4) the relationship between the independent and dependent variables must be nonsignificant or weaker when a mediating variable is introduced.

The first condition was satisfied by the support of Hypothesis 1a. The second condition was satisfied by Models 2 and 5, which show that foreign language was negatively related to participation in decision making ( $\beta = -.78$ ,  $p < .01$ ) and team creativity ( $\beta = -.37$ ,  $p < .01$ ).

The third condition was satisfied by the support of Hypotheses 1b and 1c. Finally, the fourth condition was satisfied by Models 4 and 6, which show that the effects of foreign language on both participation in decision making ( $\beta = -.50$ ,  $p < .01$ ) and creativity ( $\beta = -.24$ ,  $ns$ ) became weaker or nonsignificant when communication was entered into the regression equations. The former indicated partial mediation, and the latter indicated full mediation.

As shown in Table 2, the bootstrapping approach also revealed that foreign language had significant indirect effects on participation in decision making ( $\beta = -.28$ ,  $p < .01$ ) and on creativity ( $\beta = -.13$ ,  $p < .05$ ) through communication. The 95% confidence intervals of the indirect effects ranged from  $-.51$  to  $-.11$  and from  $-.30$  to  $-.01$ , respectively.

Table 3 Results for the causal relationships among individual-level variables<sup>a, b, c, d, e</sup>

Variable	Individual Level			
	Stress	Satisfaction		
	Model 1	Model 2	Model 3	Model 4
Age	-.03 (.05)	.02 (.04)	.01 (.04)	.01 (.04)
Gender	.02 (.15)	.33* (.13)	.33** (.12)	.35** (.12)
Foreign language	.31* (.14)	-.34* (.13)		-.26* (.11)
Stress			.35** (.06)	-.32** (.06)
Within-team (level 1) variance	.68	.49	.42	.41
Intercept (level 2) variance	.18	.17	.47	.47
Indirect Effect		Estimate	95% CI Lower	95% CI Upper
Foreign language → stress → satisfaction		-.10*	-.21	.00

Notes. <sup>a</sup> Individual N = 222; Foreign language: 0 = Chinese; 1 = Japanese; Gender: 0 = male; 1 = female.

<sup>b</sup> \* $p < .05$ ; \*\* $p < .01$ .

<sup>c</sup> CI = confidence interval

<sup>d</sup> Scores on stress and satisfaction were calculated based on parceled items.

<sup>e</sup> Standard errors are in parentheses.

**Test of hypothesis 2.** As the first step of hierarchical linear modeling, we computed the ICCs to evaluate the percentage of total variances in perceived stress and satisfaction (Aguinis, Gottfredson, & Culpepper, 2013). The ICCs were .12 ( $F [53, 165] = 1.59, p < .05$ ) for stress and .18 ( $F [53, 160] = 1.91, p < .01$ ) for satisfaction, meaning that differences in teams could account for about 12% and 18 % of the variances in individual stress and satisfaction, respectively. Because ICC values reported in multilevel studies generally range from .10 and .25 (Hedges & Hedberg, 2007), those ICC values reported above can serve as a justification for treating stress and satisfaction as individual-level variables. Table 3 shows the results of the hierarchical linear modeling to test Hypotheses 2a through 2c.

Models 1 and 2 in Table 3 show that foreign language was positively related to stress ( $\beta = .31, p < .05$ ) and negatively related to satisfaction ( $\beta = -.34, p < .05$ ), which supports Hypotheses 2a and 2b, respectively. In addition, Model 3

shows that stress was negatively related to satisfaction ( $\beta = -.35, p < .01$ ), which supports Hypothesis 2c. We also tested the mediating relationship assumed implicitly in Hypotheses 2a through 2c. The support of Hypotheses 2a, 2b, and 2c satisfied Baron and Kenny's (1986) first, second, and third conditions, respectively. As for the fourth condition, Model 4 shows that the effect of foreign language remained significant but became weaker ( $\beta = -.26, p < .05$ ) when stress was entered into the regression equation (see Model 4 in Table 3), which suggests partial mediation. As shown in Table 3, a quasi-Bayesian approximation simulation using the mediation package in R (Tingley et al., 2014) also revealed that foreign language had a significant indirect effect on satisfaction ( $\beta = -.10, p < .05$ ) through stress. The 95% confidence interval of the indirect effect ranged from  $-.21$  to  $.00$ . Therefore, the implicit assumption of the mediating relationship is supported.

**Test of hypothesis 3.** In order for testing hypotheses 3a and 3b, we grand-mean centered par-

Table 4 Results for the cross-level interactions<sup>a, b, c</sup>

Level and variable	Stress			Satisfaction		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Level 1</b>						
Intercept	3.50* ( .07)	3.48** (1.29)	4.15** (1.20)	5.16** ( .07)	5.72** (1.17)	4.98** ( .98)
Foreign language		.29* ( .14)	-.00 ( .16)		-.29* ( .13)	.08 ( .13)
Age		-.03 ( .05)	-.04 ( .05)		.01 ( .04)	.03 ( .04)
Gender		.03 ( .15)	.06 ( .14)		.34** ( .13)	.27* ( .12)
<b>Level 2</b>						
Participation in decision making			-.65** ( .19)			.76** ( .14)
Team size		.09 ( .20)	.05 ( .18)		-.24 ( .19)	-.17 ( .15)
Two-way interactions						
Foreign language × participation in decision making			.51* ( .25)			-.49* ( .21)
Within-team (level 1) variance	.68	.69	.67	.50	.48	.48
Intercept (level 2) variance	.09	.06	.06	.11	.08	.01

Notes. <sup>a</sup> Individual N = 222; Team N = 54. Gender: 0 = male; 1 = female; Foreign language: 0 = Chinese; 1 = Japanese.

<sup>b</sup> \* $p < .05$ ; \*\* $p < .01$

<sup>c</sup> Multi-level coefficients (standard errors) are reported.

ticipation in decision making at the team level to alleviate multicollinearity (Enders & Tofighi, 2007). We did not group-mean center the individual level's predictor because language was a dummy variable. To estimate the cross-level interaction effects, we followed the procedures suggested by Aguinis et al. (2013). Table 4 shows the results of the hierarchical linear modeling.

Models 1 and 4 are null models with no predictors. Models 2 and 5 show that with the effects of control variables accounted for, foreign language was significantly related to stress ( $\beta = .29$ ,  $p < .05$ ) and satisfaction ( $\beta = -.29$ ,  $p < .05$ ). The results of Models 3 and 6 indicate that the cross-level interaction effects were significant in predicting both stress ( $\beta = .51$ ,  $p < .05$ ) and satisfaction ( $\beta = -.49$ ,  $p < .05$ ), providing support for Hypotheses 3a and 3b, respectively. To examine the nature of the significant cross-level interactions, we plotted the mean levels of member stress and satisfaction for the experimental and control groups by dividing the sample into high participation group ( $N = 27$ ) and low participation group ( $N = 27$ ) using the

median split approach (Iacobucci, Posavac, & Kardes et al., 2015). The visual inspection of the interaction plots, which are shown in Figures 2 and 3, suggests that when participation in decision making was high, stress was higher and satisfaction was lower for the members of the experimental groups than for the members of the control groups. The results of the t-tests further revealed significant mean differences in stress ( $M = 3.57$ ,  $SD = .78$  for the experimental group [ $N = 7$ ];  $M = 3.20$ ,  $SD = .97$  for the control group [ $N = 20$ ];  $t = 2.09$ ,  $p < .05$ , one tailed) and in satisfaction ( $M = 5.20$ ,  $SD = .70$  for the experimental group [ $N = 7$ ];  $M = 5.52$ ,  $SD = .75$  for the control group [ $N = 20$ ];  $t = 1.98$ ,  $p < .05$ , one-tailed), while there were no statistically different mean differences when participation in decision making was low ( $t = .18$ ,  $ns$ ;  $t = .50$ ,  $ns$ , respectively). These results indicate that the detrimental effects of using a foreign language on member outcomes become stronger as the level of participation in decision making increases. Thus, Hypotheses 3a and 3b are supported.



How does the use of a foreign language affect team processes and member stress and satisfaction?

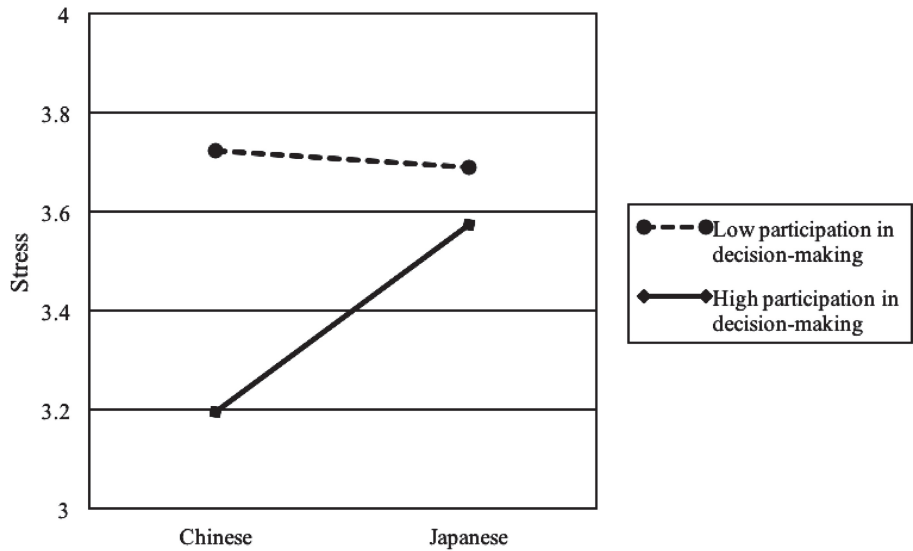


Figure 2 Cross-Level Interaction of Language and Participation in Decision making on Stress

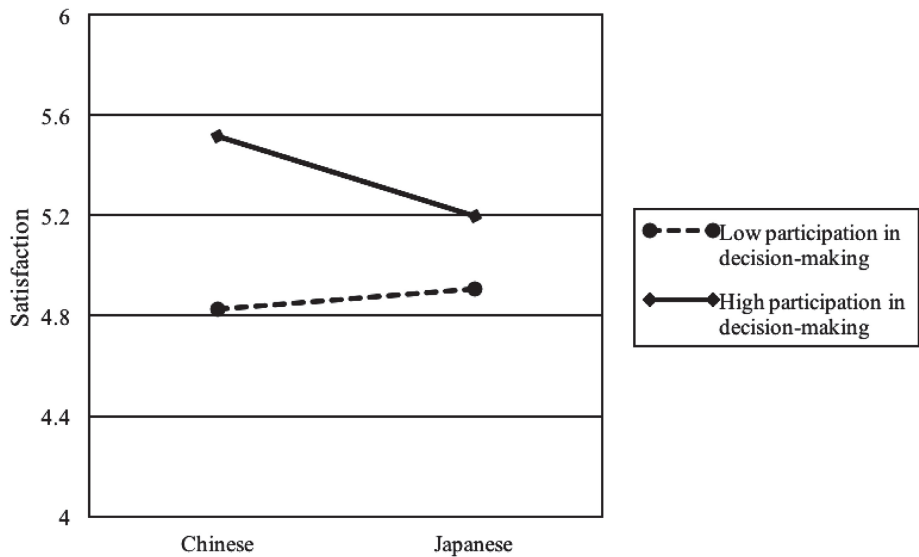


Figure 3 Cross-Level Interaction of Language and Participation in Decision making on Satisfaction

## 6 DISCUSSION

To the best of our knowledge, this is the first experimental study that empirically examined the role of language in team processes and member stress and satisfaction. In particular, we used the cognitive load theory and the JD-R theory to understand the mechanisms in which

the use of a foreign language influences team processes and member outcomes. This is noteworthy in that the majority of previous studies mainly used qualitative and survey methods to investigate the role of language in the international business context (Tenzer et al., 2014; Yamao & Sekiguchi, 2015). The results of our study generally supported our team-level and

individual-level hypotheses. The results also supported the cross-level interaction effect in which participation in decision making at the team level amplified the detrimental effects of using a foreign language on member outcomes.

## 6.1 Theoretical Implications

This study demonstrated the usefulness of the cognitive load theory and the JD-R theory to understand the language issues in team effectiveness. As found in our study, using these theories helps us to identify the mechanism through which language influences team processes and member outcomes and to develop solutions to the problems in teams that stem from the members' use of foreign languages. These theories enabled us to articulate and empirically demonstrate not only the team-level and individual-level relationships but also the cross-level interactions in which participation in decision making at the team level amplifies the negative influence of using a foreign language on individual outcomes such that stress increases and satisfaction decreases among team members. The findings on the cross-level interactions are particularly noteworthy given that participation in decision making is generally theorized to be positively related with team effectiveness (e.g., Jackson, 1983; Witt, Andrews, & Kacmar, 2000). In this regard, our study shed light on the potential dark side of participation in decision making in the international business context where employees can have cognitive load and job demands that are heavier than usual because of the use of a foreign language in work-related daily interactions.

## 6.2 Managerial Implications

The findings of our study have several managerial implications as well. For example,

Rakuten introduced English as an official corporate language, which can be seen as a milestone in linguistic innovation in Japanese firms (Neeley, 2011). However, our findings suggest that this kind of change must be made cautiously because it could lead to the decrease in team effectiveness and member wellbeing as well as other potential negative outcomes, such as absenteeism, turnover, etc. at least in a short run. We suggest that firms should strategically implement the language policy from a long-term perspective.

At the more micro-level, our study suggests that using a foreign language in a team setting increases cognitive load and job demands while decreasing job resources, which negatively influences team processes and member outcomes. Therefore, MNCs utilizing multinational teams in which members need to use foreign languages should support their teams by providing more physical, social, and psychological resources to cope with the high cognitive load and job demands. We also recommend that, in order to improve participation in team-level discussions and decision making, both headquarters and subsidiaries of MNCs should invest in employees' foreign language skills, especially in terms of their communication skills. MNCs would need to provide such communication training on a long-term basis (Zhang & Harzing, 2016).

In addition, team leaders should increase and encourage information sharing and communication within the team, particularly in a context in which a foreign language is used. It must be noted, however, that participation in decision making, if carried to excess, will result in high stress and low satisfaction for employees who communicate in a foreign language.

### 6.3 Limitations and Suggestions for Further Research

Despite the significant theoretical and practical insights it can provide, this study still has a number of limitations. First, although we randomly assigned all participants to either the experimental or the control group and found no significant mean differences in the perceived levels of Japanese proficiency between the groups, we did not assess the objective levels of language proficiency using a reliable and valid measure. The difference between the groups, if existed, might have led to the false conclusion that the foreign language caused the results when it was just individual differences in the language ability between the experimental and control groups. Future research could use more sophisticated experimental approaches.

Second, because the linguistic distance between Chinese and Japanese languages is not great, it is reasonable to assume that Chinese people would experience lower stress and higher satisfaction in team situations in which they must communicate in Japanese rather than in German, French, or other European languages. To take the linguistic distance into account, future studies should be designed in such a way as to incorporate many different languages with various lexical distances to each other. It would be a reasonable prediction that the greater the distance between languages, the stronger the effect of foreign language on team processes and individual outcomes, a prediction that remains to be tested in the literature.

Finally, it should be noted that this study focused on such limited variables as communication, participation in decision making, creativity as team processes and outcomes, and member stress and satisfaction. Attending to other team-level constructs such as shared men-

tal models (Mathieu, Heffner, & Goodwin et al., 2000), transactive memory systems (Austin, 2003; Lewis, 2004), and climate for innovation (Somech & Drach-Zahavy, 2013), as well as to other individual-level constructs such as citizenship behavior (Podsakoff, Whiting, Podsakoff, & Blume, 2009), voice (Detert & Burris, 2007), and creative process engagement (Zhang & Bartol, 2010) would be of potential interest. This line of research will extend our knowledge on the relationship between language and team effectiveness in the context of international business.

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**Appendix****A. Perceived Japanese language proficiency ( $\alpha = .79$ )**

1. I rate my speaking ability in Japanese as...;
2. I rate my understanding ability in Japanese as...;
3. I rate my reading ability in Japanese as...;
4. I rate my writing ability in Japanese as....

**B. Communication items ( $\alpha = .90$ )**

1. Members of my team were very willing to share information with other team members about our work.
2. My team enhanced the communication among members working on the same project.
3. Members of my team cooperated to get the work done.

**C. Participation in decision making ( $\alpha = .86$ )**

1. Most members of my team got a chance to participate in decision making.
2. My team was designed to let everyone participate in decision making.

**D. Creativity ( $\alpha = .92$ )**

1. Magnitude: how great the consequence of this proposal would be (1 = of no consequence at all to 7 = of great consequence).
2. Radicalness: the extent to which the proposal is likely to change the status quo (1 = not at all radical to 7 = extremely radical).
3. Usefulness: the extent to which the proposal is beneficial to the company (1 = will not be of benefit at all to 7 = will greatly benefit).

**E. Stress ( $\alpha = .77$  for 8 items;  $\alpha = .78$  for 4-item parcels)**

1. During/after the teamwork, how often were you upset because of something that happened unexpectedly?
2. During/after the teamwork, how often did you feel nervous and “stressed”?
3. During/after the teamwork, how often did you feel confident about your ability to handle the team task? (Reversed scored item)
4. During/after the teamwork, how often did you find it difficult to cope with all the things that you had to do?
5. During/after the teamwork, how often did you get angry because of things that happened beyond your control?
6. During/after the teamwork, how often did you find yourself thinking about things that you had to accomplish?
7. During/after the teamwork, how often were you able to control the way you spent your time? (Reversed scored item)
8. During/after the teamwork, how often did you feel that difficulties were piling up so high that you could not overcome them?

Parceled stress 01: item numbers 2 and 3

Parceled stress 02: item numbers 1 and 7

Parceled stress 03: item numbers 8 and 6

Parceled stress 04: item numbers 4 and 5

**F. Satisfaction ( $\alpha = .94$  for 14 items;  $\alpha = .95$  for 4-item parcels)**

1. Being able to keep busy all the time.
2. The chance to work alone on the teamwork.
3. The chance to do different things from time to time.
4. The chance to be “somebody” in the team.
5. The chance to tell people what to do.

How does the use of a foreign language affect team processes and member stress and satisfaction?

6. The chance to do something that made use of my abilities.
7. The freedom to use my own judgement.
8. The chance to try my own methods of doing the team task.
9. The working conditions.
10. The way my team members got along with each other.
11. The praise I got for doing a good job.
12. The feeling of accomplishment I got from the teamwork.
13. I would be willing to work with this team on other projects in the future.
14. Working with my team was an enjoyable experience.

Parceled satisfaction 01: item numbers 6, 4, 13, 2

Parceled satisfaction 02: item numbers 12, 8, 14, 5

Parceled satisfaction 03: item numbers 1, 10, 3

Parceled satisfaction 04: item numbers 11, 9, 7